Setting National Targets to Reduce Unnecessary Antibiotic Prescribing

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Antibiotic Resistance Project

Use in Human Healthcare

Use in Food Animals

Innovation

The Path to Setting National Targets

- Establishing the methodology for measuring antibiotic use
  - Ability to assess appropriateness
    - "Quality" of antibiotic prescribing, not just "Quantity"
  - Replicable on a year-to-year basis
    - Mechanism to track progress
  - Utilization of a comprehensive data source
    - Nationally representative data
  - Consensus among experts

Partnership between Pew and U.S. Centers for Disease Control and Prevention

Setting National Targets - Outpatient

- Methodology
  - Data Source: National Ambulatory Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS)
    - Nationally representative sample of visits in office-based visits, emergency departments, and outpatient departments in hospitals
    - Data includes demographics, medications, and diagnoses
  - Analysis
    - Outcome #1: Based on diagnoses, percentage of antibiotics prescribed that are unnecessary
    - Outcome #2: For three diagnoses, percentage of prescriptions with inappropriate selection of antibiotics

Unnecessary Outpatient Antibiotic Use

JAMA — The Journal of the American Medical Association

Research

Original Investigation

Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011

Katherine E. Fleming-Dutra, MD; Adam L. Hersh, MD, PhD; Daniel J. Shapiro; Monina Bartoces, PhD; Eva A. Enns, PhD; Thomas M. File Jr, MD; Jonathan A. Finkelstein, MD, MPH; Jeffrey S. Gerber, MD, PhD; David Y. Hyun, MD; Jeffrey A. Linder, MD, MPH; Ruth Lynfield, MD; David J. Margolis, MD, PhD; Larissa S. May, MD, MSPH; Daniel Merenstein, MD; Joshua P. Metlay, MD, PhD; Jason G. Newland, MD, MEd; Jay F. Piccirillo, MD; Rebecca M. Roberts, MS; Guillermo V. Sanchez, MPH, PA-C; Katie J. Suda, PharmD, MS; Ann Thomas, MD, MPH; Teri Moser Woo, PhD; Rachel M. Zetts; Lauri A. Hicks, DO

IMPORTANCE The National Action Plan for Combating Antibiotic-Resistant Bacteria set a goal of reducing inappropriate outpatient antibiotic use by 50% by 2020, but the extent of inappropriate outpatient antibiotic use is unknown.
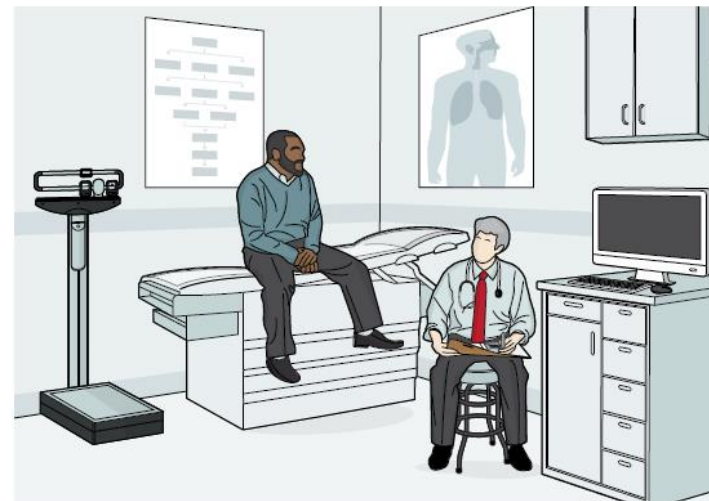
Editorial page
Supplemental jama.com
CME Quiz at

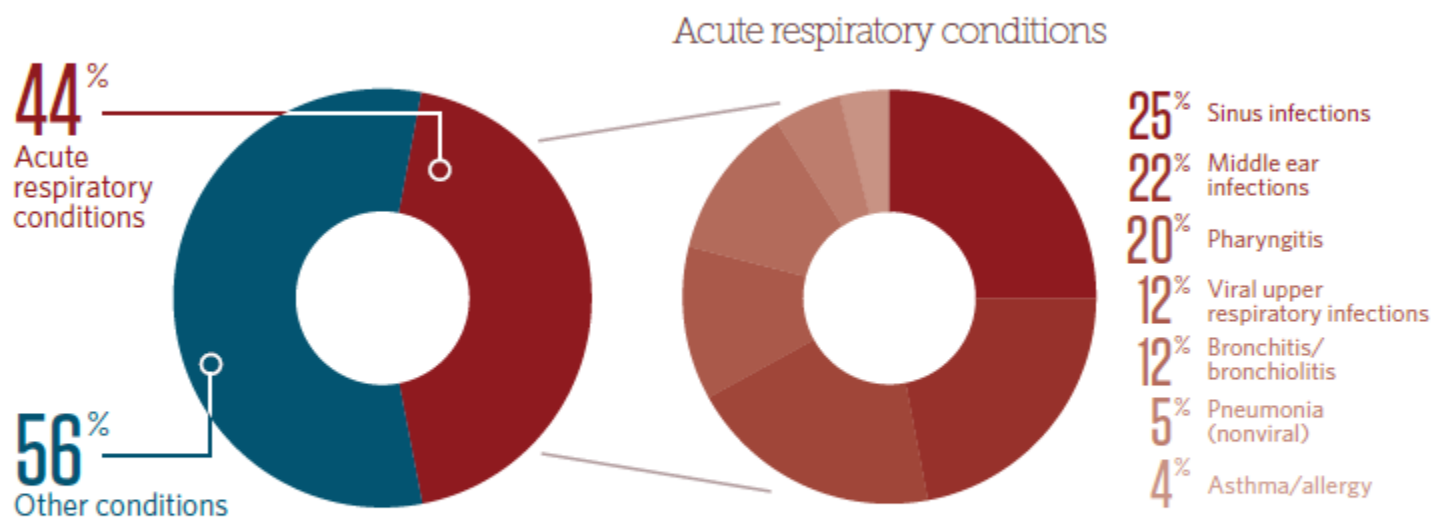A report from THE PEW CHARITABLE TRUSTS | May 2016

Antibiotic Use in Outpatient Settings

Health experts create national targets to reduce unnecessary antibiotic prescriptions

Outpatient Antibiotic Use in U.S.

Figure 1

Outpatient Antibiotic Prescriptions by Diagnosis

Acute respiratory conditions

44% Acute respiratory conditions

56% Other conditions

25% Sinus infections

22% Middle ear infections

20% Pharyngitis

12% Viral upper respiratory infections

12% Bronchitis/bronchiolitis

5% Pneumonia (nonviral)

4% Asthma/allergy

Note: Not pictured are influenza and viral pneumonia. There are not enough visits with an antibiotic prescribed in the data set to calculate reliable estimates for these diagnoses individually. Both diagnoses do contribute to the total number of antibiotics prescribed for acute respiratory conditions.

Source: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011
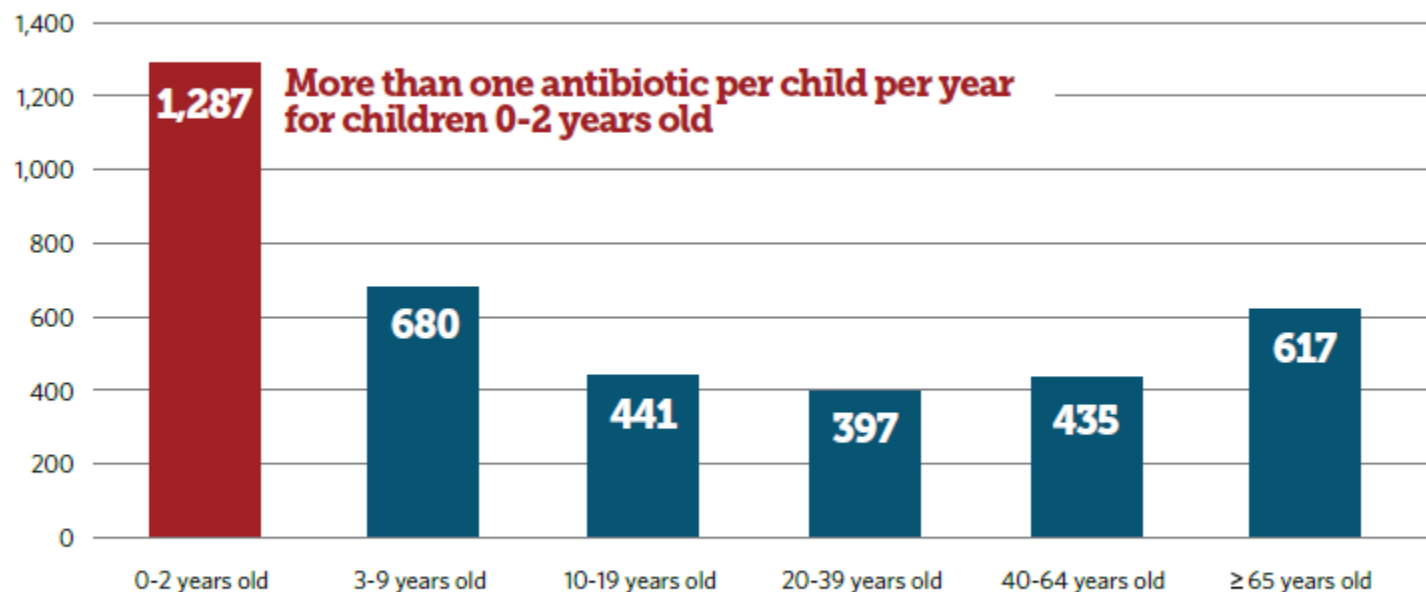
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Outpatient Antibiotic Use in U.S.

Figure 2
Outpatient Antibiotic Prescriptions (per 1,000 People) by Age

More than one antibiotic per child per year for children 0-2 years old

Bar chart values:
- 0-2 years old: 1,287
- 3-9 years old: 680
- 10-19 years old: 441
- 20-39 years old: 397
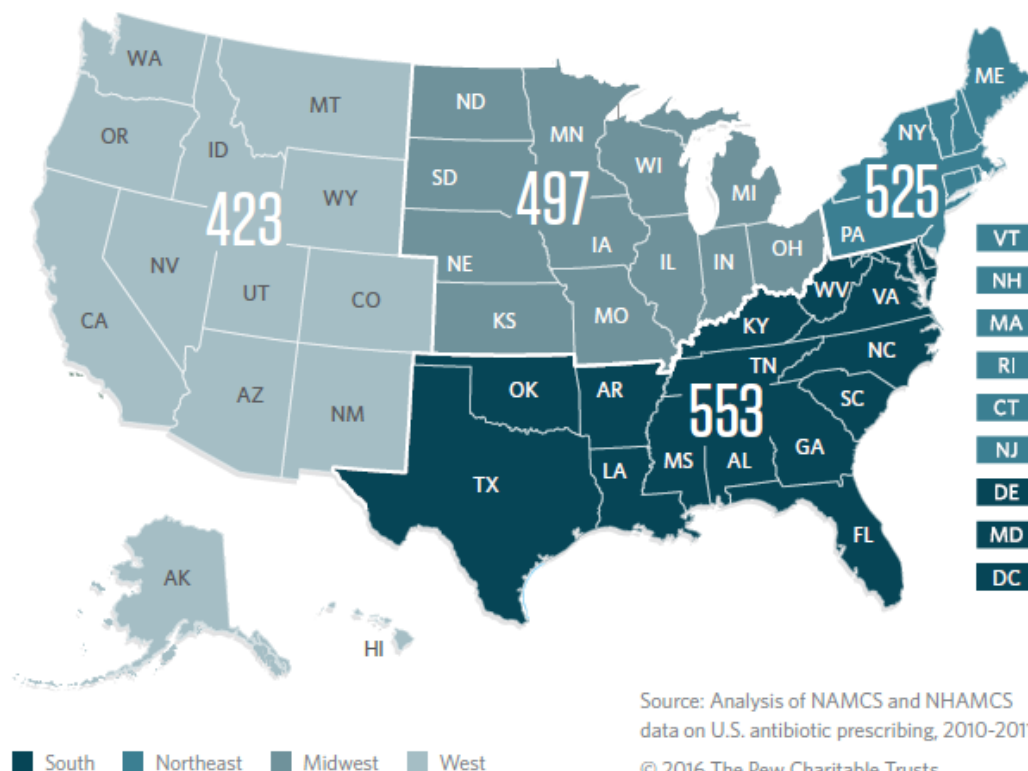- 40-64 years old: 435
- ≥ 65 years old: 617

Source: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011

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Outpatient Antibiotic Use in U.S.

Figure 3

Outpatient Antibiotic Prescriptions (per 1,000 People) by Region

Source: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011

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Legend: South, Northeast, Midwest, West

Unnecessary Outpatient Antibiotic Use

Proportion of unnecessary antibiotic use: All conditions

30% Unnecessary use

70% Appropriate use
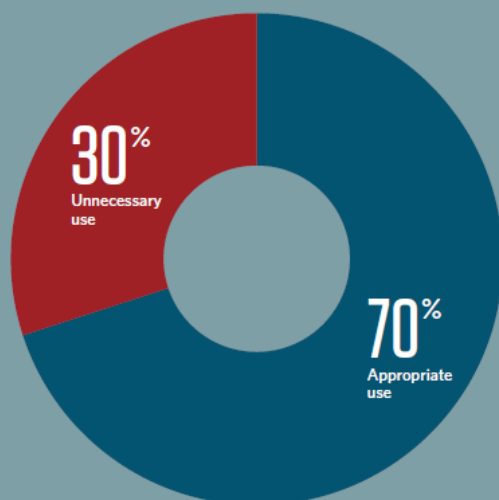
Figure 5

Outpatient Antibiotic Prescribing Reduction Targets
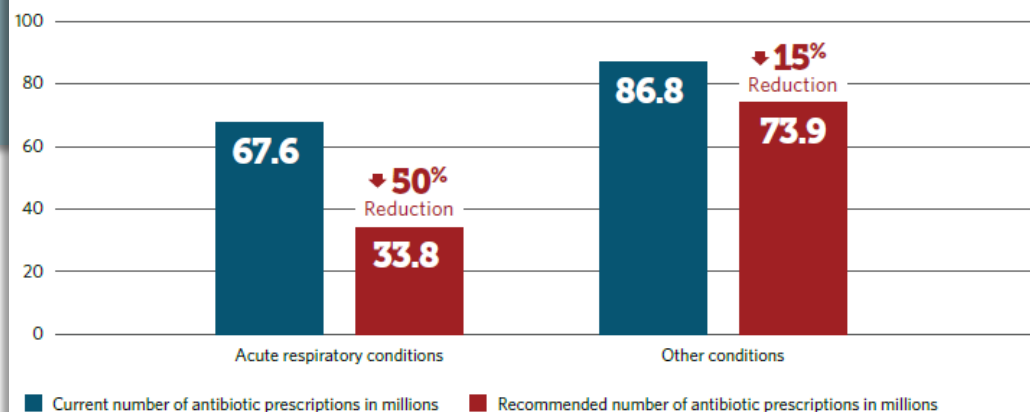
Acute respiratory conditions: 67.6 Current, ↓50% Reduction, 33.8 Recommended

Other conditions: 86.8 Current, ↓15% Reduction, 73.9 Recommended

■ Current number of antibiotic prescriptions in millions   ■ Recommended number of antibiotic prescriptions in millions
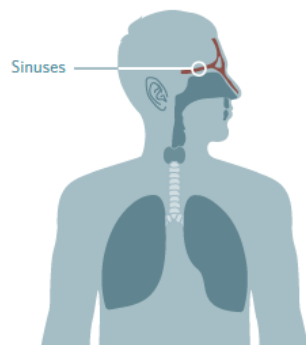
Source: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011

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Unnecessary Outpatient Antibiotic Use

Figure 6

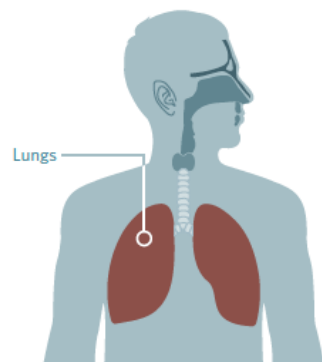## Recommended Prescribing Reduction–Sinus Infections

Sinuses

- ▼ **9**% 0-19 years old
- ▼ **51**% 20-64 years old
- ▼ **16**% 65 years and older

Source: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011

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Figure 11

Recommended Prescribing Reduction–Bronchitis and Bronchiolitis

Lungs

- ▼ **100**% All ages

Source: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011

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Inappropriate Outpatient Antibiotic Selection

A brief from ☼ THE PEW CHARITABLE TRUSTS | Oct 2016

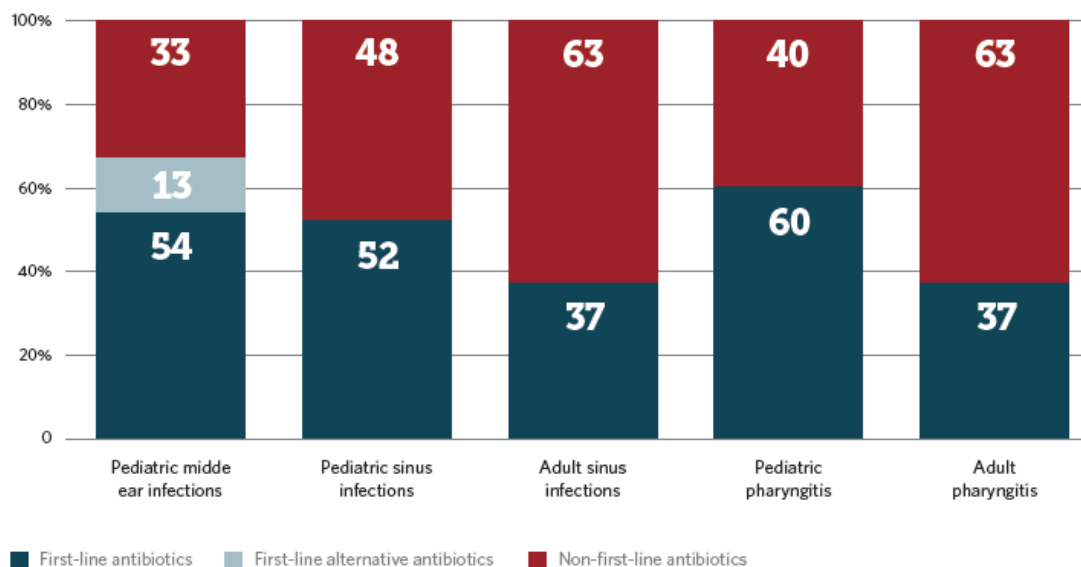**Health Experts Establish National Targets to Improve Outpatient Antibiotic Selection**

Inappropriate Outpatient Antibiotic Selection

All 3 Conditions, all ages:
52% First Line Agents

National Goal:
80% First Line Agents

Figure 1
Outpatient Antibiotic Prescriptions, 2010-11

Note: The recommended first-line antibiotic for middle ear infections is amoxicillin. An alternative first-line therapy in select circumstances is amoxicillin with clavulanate, which is recommended as initial therapy only in select circumstances (for example, concurrent ear and eye infections). Recommended first-line antibiotics for sinus infections include amoxicillin or amoxicillin with clavulanate. Recommended first-line antibiotics for pharyngitis include amoxicillin or penicillin.

Sources: Analysis of NAMCS and NHAMCS data on U.S. antibiotic prescribing, 2010-2011.

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Setting National Targets - Hospitals

- Methodology
  - CDC Emerging Infections Programs (EIP)
    - Assessment of appropriate use for two antibiotic agents and two conditions
  - CDC National Healthcare Safety Network (NHSN)
    - Antibiotic Use and Resistance Module
    - Development of Antibiotic Use Measure: Standardized Antibiotic Administration Ratio (SAAR)

Standardized Antibiotic Administration Ratio

National Healthcare Safety Network

SAARs Table - All Standardized Antimicrobial Administration Ratios (SAARs) High-Level Indicators and High-Value Targets
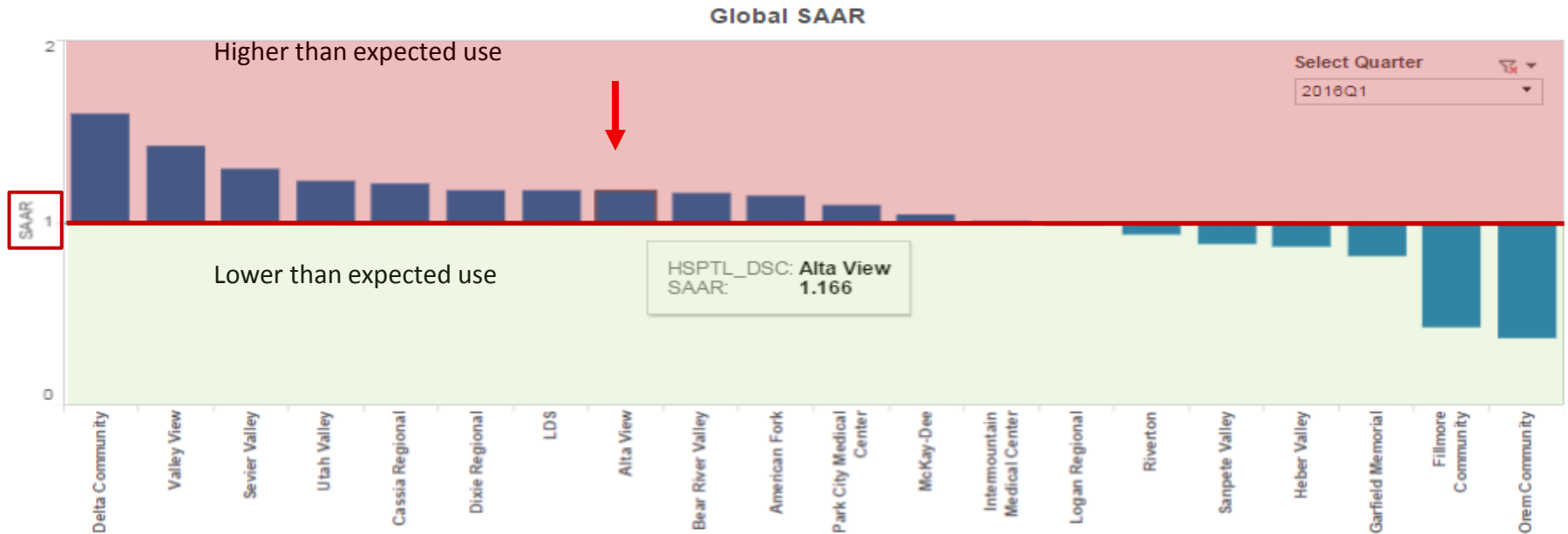
As of: January 27, 2016 at 10:59 AM

Date Range: AU_SAAR summaryYQ 2014Q1 to 2014Q4

All antimicrobials used in adult ICUs and wards

orgID	summaryYQ	SAARType	antimicrobialDays	numAUDaysPredicted	numDaysPresent	SAAR	SAAR_pval	SAAR95CI
13860	2014Q1	IND-Adult-1	4416	4421.364	6326	0.999	0.9437	0.970, 1.029
13860	2014Q2	IND-Adult-1	3998	3856.677	5668	1.037	0.0240	1.005, 1.069
13860	2014Q3	IND-Adult-1	3568	3952.912	5765	0.903	0.0000	0.873, 0.933
13860	2014Q4	IND-Adult-1	6835	5731.061	9247	1.193	0.0000	1.165, 1.221

Observed Use / **Predicted Use** = **SAAR**

SAAR Dashboard

Global SAAR

Higher than expected use

Lower than expected use

Select Quarter
2016Q1

HSPTL_DSC: **Alta View**
SAAR: **1.166**

Facilities (x-axis): Delta Community, Valley View, Sevier Valley, Utah Valley, Cassia Regional, Dixie Regional, LDS, Alta View, Bear River Valley, American Fork, Park City Medical Center, McKay-Dee, Intermountain Medical Center, Logan Regional, Riverton, Sanpete Valley, Heber Valley, Garfield Memorial, Fillmore Community, Orem Community

Individual SAARs for the selected facility

Adult

x-axis: 1 Global SAAR - Adult, 2 HAI in Adult ICUs, 3 HAI in Adult Med/Surg, 4 Broad-spec in Adultt ICUs, 5 Broad-spec in Adult Med/Surg, 6 Anti-MRSA in Adult ICUs, 7 Anti-MRSA in AdultMed/Surg, 8 Surgical prophylaxis - Adults